Annotated List of the Species of Chrysops occurring in New Jersey and Descriptions of two New Species.

By Erich Daecke, Philadelphia.

(Plate VI.)

Since the publication of the New Jersey State List of Insects, by Prof. John B. Smith, in 1899, in which were recorded sixteen species of *Chrysops*, the number of species in this genus has been more than doubled. The local interest taken in this genus, as well as in other genera, families and orders, can be traced directly to Prof. Smith's list, which not only served many local collectors as a check-list, but stimulated their work to no small degree. It indicates the value and even the necessity of State lists.

The wing picture is an excellent differentiating character in the genus *Chrysops*, hence I have figured the wing of every species so far collected in New Jersey, avoiding extreme and perplexing forms which at times will occur.

The figures are three-fold enlargements from average wings, and the difference in size of figures gives the relative proportion between the species. All the figures represent the wings of females.

1. **C. excitans** Walker.

One specimen out of a large series from Bamber, v, 27, has anal cell open. The yellow on sides of abdomen extends to the third, rarely the fourth, segment on the South Jersey specimens. Mr. William T. Davis has collected *excitans* at Lakehurst, VI, 15.

2. **C. celer** Osten Sacken.

Common everywhere, from middle of May to beginning of July. Specimens worn by flight often lack the characteristic fulvous pile on pleura, and are easily mistaken for *mitis*, and if such specimens happen to have the fifth posterior cell entirely hyaline, as I have occasionally found on some specimens of *celer*, as well as on some specimens of *carbonarius*, they may also be mistaken for the latter. The broad and spatulate grayish-white space between the facial callosities of *celer*, which is narrower on *mitis* and almost linear on *carbonarius*, will be of value. The difference of infuscation on second basal cell also serves well as a differentiating clue. See figures.

3. **C. carbonarius** Walker = **fugax** O. S.

Not rare in South Jersey. The extreme dates of my captures are Lacy, V, 27, and Da Costa, VI, 15. Miss Ricardo has placed *fugax* O. S. in the synonymy after examining the tion, but the student not familiar with this species must necessarily read the description of *fugax* O. S. to understand what *carbonarius* Walk. is supposed to be.

4. **C. mitis** Osten Sacken.

Two specimens, one in Mr. Harbeck's collection, Jamesburg, July 4th; another in my collection, Brown's Mills Jc., June 25th. These two specimens are smaller than the normal *mitis* and may possibly be freaks of *celer*, though, according to all recorded characters, they belong to *mitis*. The eyes of these two specimens are like those of *celer*, that is, with shaft present. I have examined the eyes of Baron Osten-Sacken's type of *mitis* in the Academy collection, and they correspond with those of *carbonarius-fugax*, that is: shaft absent. See Plate I, Ent. News, Vol. XVII.

Mitis is very closely allied to *carbonarius* and may possibly be a variation of same. Mr. Whitney writes me: "The typical *mitis* is extremely rare here (Milford, N. H.), although *fugax* is abundant in variety almost to the *mitis* type. I have no faith in their separateness."

5. **C. cuclux** Whitney.

Only recorded by Mr. A. J. Weidt from the Orange Mountains in May.

6. **C. niger** Macquart.

Common everywhere, May 12th-July 4th.

7. **C. brimleyi** Hine.

This species appears about the end of May and is a typical pine-barren insect.

8. **C. amazon** Daecke.

This species is rare, even in its type locality. Brown's Mills Jc., end of June—beginning of July.

9. **C. nigribimbo** Whitney.

About the end of June till September, all through the pine barrens.

10. **C. plangens** Wiedemann.

This species is common along salt marshes. Anglesea, May 28th, Newark meadows, June, A. J. Weidt. Staten Island, June 3-10, Wm. T. Davis.

11. **C. fallax** Osten Sacken.

Locally common. Wenonah, June 22; Jamesburg, July 4th.

12. **C. moechus** Osten Sacken.

I have never seen this species in numbers, but Mr. Harbeck records it to be the most common species near Trenton about the first week in July.

13. **C. univittatus** Macquart.

Locally a pest along the edges of woods. My extreme data are from Wenonah, June 14th to July 15th.

14. **C. bistellatus** Daecke.

This species I have only taken so far at its type locality, Brown's Mills Jc., from end of June to middle of July.

15. **C. indus** Osten Sacken.

Rare in New Jersey. I have only taken it at Clementon, from which locality it has been previously recorded by Mr. Johnson and Mr. Harbeck, May 10 to 15. Mr. Wenzel has taken one specimen at Almonessen, May 20th.

16. **C. vittatus** Wiedemann.

A widely distributed and rather common species. Brown's Mills Jc., June 24th; Wenonah, July 27th; Lucaston, Aug. 6th; Bamber, Sept. 1st.

17. **C. striatus** Osten Sacken.

This species is rare in New Jersey, and in local collections it is not uncommon to find *sequax* and *hinei* (a new species described in this paper) under the name of *striatus*. Delair, Aug. 7th.

18. **C. sequax** Williston.

The New Jersey specimens have a yellowish frontal callus, margined with black; the types from western Kansas are described as having a black frontal callosity. There is no other perceptible difference. Wenonah, July 27th.

19 **C. lugens** Wiedemann.

The only two New Jersey specimens on record were collected by Mr. Harbeck at Trenton, July 5, 1906. This species belongs to the Southern Atlantic and Gulf States, where it appears to be smaller and darker.

C. lugens var. *morosus* Osten Sacken.

Bamber, July 9; Tom's River, July 12; Newbold, ♂ ♂; July 14, ♀ ♀, July 21. Baron Osten-Sacken was familiar with Dr. Wiedemann's description of *lugens* when he described his *morosus* as a new species, and stated in his Prodrome, page 394, that he had never seen *lugens.* These two forms are apparently distinct; the descriptions bear this out, but Prof. James S. Hine has in his collection the complete chain of intergrades, hence *morosus* must be considered a variety of *lugens.* The wing, Fig. 19, answers for both forms, *lugens* and *morosus.* While studying these forms I collected more than 125 specimens, with the result that two new species were separated from this group, of which a table may read like this:

lugens, abdomen brown, one yellowish longitudinal line.
lugens, var. *morosus,* abdomen brown, three brownish yellow stripes.
parvulus n.sp., abdomen altogether brown.
hinei n. sp., abdomen orange, two blackish stripes.

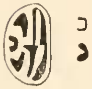
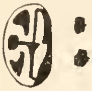
20. **C. parvulus** n. sp. ♀.

Length 5½-7 mm. Face brownish-yellow; facial callosities, cheeks, and frontal callus black; front covered with grayish pollen. First antennal segment yellowish, second segment basally brown, the rest black. Frontal spot on eyes more or less excised anteriorly; occipital border separated from occiput. Thorax brownish-black, sparsely covered with whitish hair; two dorsal stripes barely recognizable cephalad, and this only in a certain light. Pleura brown, with two grayish stripes, the upper one indistinct. Abdomen uniformly brown, sparsely beset with whitish hair toward apex. Venter uniformly brown and glossy. Front tibiæ, except the base, also tarsi, dark brown; middle legs brownish-yellow, except the tarsi apically dark brown; hind legs, except base of tarsi, base of tibiæ, and apex of femora, dark brown. Wings: Costal cells and first basal, except a small spot near apex, brown; the crossband fills out the discal and fourth posterior cells, its distal convex border begins at tip of posterior intercalary and touches the first longitudinal. The apical spot scarcely reaches the third longitudinal. See Fig. 20.

Described from 98 specimens taken at Bamber, N. J., July 9, '06; one specimen, Tom's River, July 12, '04; two specimens from Jamesburg, N. J., July 4th, collected by Mr. Harbeck, and one specimen from Lakehurst, N. J., collected by Mr. W. T. Davis.

The specimens referred to by Baron Osten-Sacken at the end of his description of *C. morosus*, Prodrome, page 390, undoubtedly belong to this species. He writes: "Two females and a male, also from Maryland, are smaller, abdomen altogether brown, front tibiæ, etc., etc. I am doubtful whether they belong here."

This species would appear to be in line with the variations of *lugens*. Hypothetically, *lugens* would be the intermediate form between *morosus* and *parvulus*, but I have taken the extremes, *morosus* and *parvulus*, in great numbers at the same date and place, Bamber, July 9th, while *lugens* could not be found. Besides, I offer the following comparative diagnosis as proof of their separateness:

parvulus,	*lugens* and *morosus*.
 Size 5½–7 mm. Occipital border of eye not connected with occiput. Frontal spot more or less excised anteriorly (see fig. and variations of frontal spot). Thoracic stripes barely visible. Abdomen uniformly brown. Apical spot of wings scarcely reaches third longitudinal. Hind femora and tibiae dark brown, except extreme section of knee.	 Size 7–8½ mm. (The two N. J. specimens of *lugens* are 7½ mm.) Occipital border of eye connected with occiput. Frontal spot filled out. (See fig. and variations of frontal spot.) Thoracic stripes very distinct, abdomen striped (*lugens* one stripe; *morosus* three stripes). Apical spot exceeds third longitudinal. Apical third of hind femora also tibiae yellowish;

21. **C. hinei** n. sp. ♀.

Length 7½-8½ mm. Face, facial callosities, cheeks, and frontal callus yellow, the latter at times narrowly margined with brown. Front dark brown, with grayish pollen. The brown shining ocellar tubercle prominent. First antennal segment yellow-ferruginous, second reddish-brown, third from brown to black. Thorax and scutellum brown.

The greenish gray middorsal thoracic stripes narrowly separated, the lateral stripes yellowish-gray and more prominent in color. Two yellowish-gray stripes on pleura. Abdomen orange, with two longitudinal, well-defined brown stripes, which meet anteriorly at the scutellum and posteriorly at the fifth segment. Apical portion of abdomen tinged with brown. Laterally at base of third and fourth segments a brown spot each as if indicating an omitted stripe. Some specimens show an indistinct, pale brown lateral marking on first and second segments. Venter orange, blackish at tip, one narrow indistinct brownish stripe laterally and a broad central stripe reaching from tip to third segment. Legs yellow-ferruginous. Fore tibiæ, except base and tarsi brown; distal portion of middle tibiæ and tarsi, brown; hind femora basally, hind tibiæ and tarsi apically brown. Wings: The costal cells, first basal, discal, and fourth posterior cells infuscated. This infuscation is unbroken to the outer margin of crossband, which begins at tip of posterior intercalary and extends convexly to first longitudinal. The apical spot fills out the apex of wing, leaving but a narrow crescent for the hyaline triangle which widens posteriorly. See Fig. 21.

Described from seventeen specimens collected at Iona, Aug. 25, '02; Weymouth, Aug. 16, '04; Atlantic County, Aug. 7, and Lakehurst, Aug. 18, Prof. John B. Smith; Lakehurst, Sept. 3 and 16, Mr. Wm. T. Davis.

One doubtful ♂, collected by Mr. Harbeck, Sept. 7, '05, at Clementon, I refer to this species. Its general appearance, date of capture and locality point toward *hinei*, but I defer description to a later date awaiting more conclusive proof.

This species belongs to the *lugens-morosus* group, from which it is readily separated by the narrow hyaline triangle, the orange abdomen striped with black and the yellow callosities.

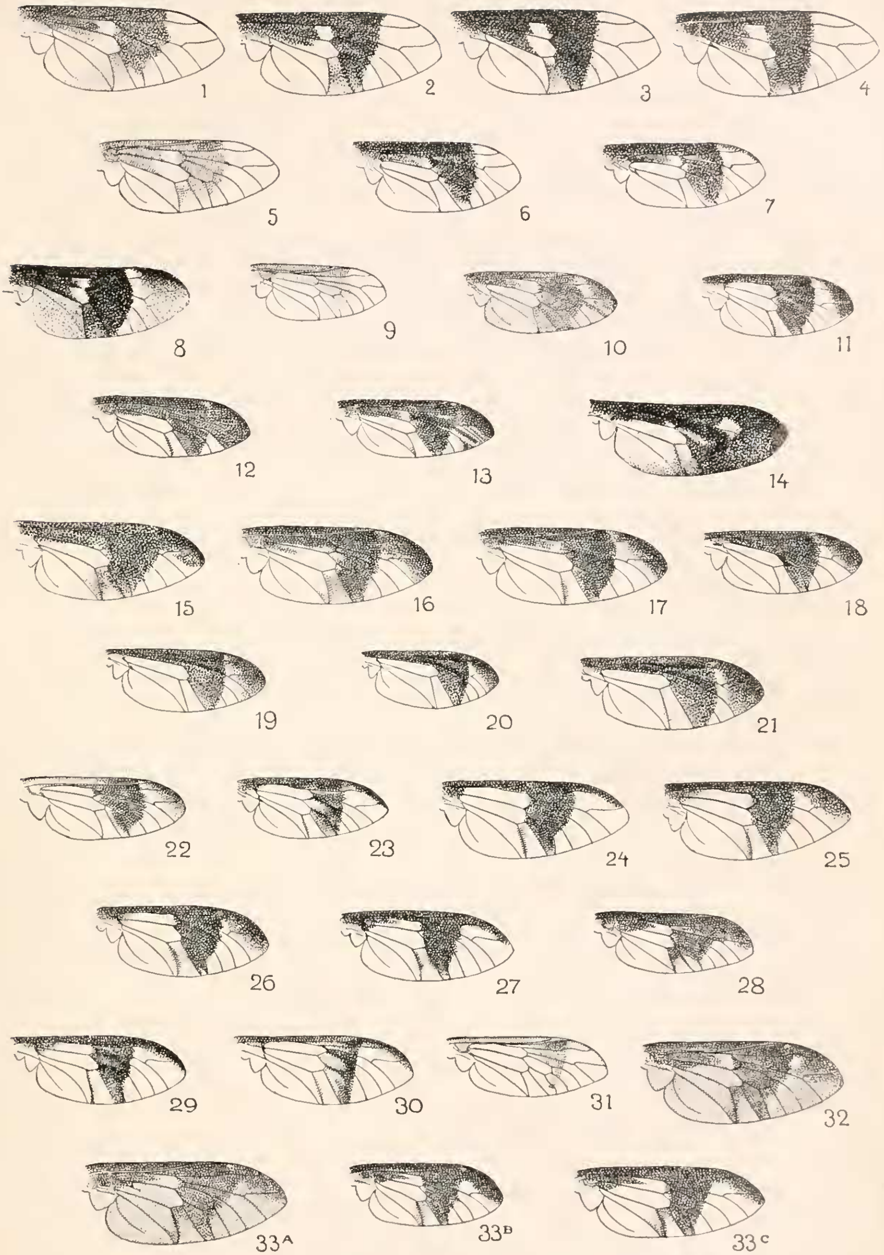
Named in honor of Prof. James S. Hine, who has added so much to the knowledge of this family.

22. **C. obsoletus** Wiedemann.

Not a common species in New Jersey. Fort Lee, June 23; Wenonah, June 22; National Park, Aug. 13.

23. **C. delicatulus** Osten Sacken.

The first New Jersey specimens I collected at Tom's River, July 12, '04, and considered a rare find, but since, I have taken it all through the pine barrens. It is a typical pine barren



1, *excitans*
2, *celer*
3, *carbonarius*
4, *mitis*
5, *cuclux*
6, *niger*
7, *brimleyi*
8, *amazon*
9, *nigribimbo*
10, *plangens*
11, *fallax*
12, *moechus*
13, *univittatus*
14, *bistellatus*
15, *indus*
16, *vittatus*
17, *striatus*
18, *sequax*
19, *lugens*
20, *parvulus*
21, *hinei*
22, *obsoletus*
23, *delicatulus*
24, *callidus*
25, *dimmocki*
26, *montanus*
27, *sackeni*
28, *frigidus*
29, *pudicus*
30, *cursim*
31, *fulvistigma*
32, *brunneus*
33a, *flavidus*
33b, *flavidus*
33c, *flavidus*

DRAWN BY E. DAECKE.